WHAT IS CLAIMED IS:

1. An electronic device comprising:

two transmission-receiving antennas respectively adapted to different frequency bands;

a receiving antenna for the frequency bands which forms two diversity antennas together with the transmission-receiving antennas; and

a wireless communication unit, connected to the transmission-receiving antennas and the receiving antenna, which performs wireless communication in each of the frequency bands.

2. The electronic device according to claim 1, wherein

the receiving antenna is provided between the transmission-receiving antennas.

3. The electronic device according to claim 1, wherein

the transmission-receiving antennas include a first transmission-receiving antenna adapted to a relatively high frequency band and a second transmission-receiving antenna adapted to a relatively low frequency band; and

the receiving antenna is disposed at a predetermined distance from the first and second transmission-receiving antennas, thereby constituting the diversity antenna adaptive to each of the frequency bands.

4. The electronic device according to claim 1, wherein

the transmission-receiving antennas include the first transmission-receiving antenna adapted to a first frequency band on a wavelength λa and the second transmission-receiving antenna adapted to a second frequency band on a wavelength λb; and

the receiving antenna is

disposed at a distance of "(2n + 1) *λa/4 (however, n = 1, 2, 3, ...) from the first transmission-receiving antenna, and

disposed at a distance of "(2n + 1) *λb/4 (however, n = 1, 2, 3, ...) from the second transmission-receiving antenna.

5. The electronic device according to claim 1, wherein

the wireless communication unit includes a filter circuit for separating a radio frequency signal received by the receive-dedicated antenna into signals in the respective frequency bands.

6. An electronic device comprising:

a display unit which hold a display panel;

an antenna unit including three antennas provided at a portion of the display unit; and

a wireless communication unit which is connected to the antennas and achieves a wireless communication function in first and second frequency bands,

wherein the antenna unit has:

two transmission-receiving antennas respectively adapted to the first and second frequency bands; and

a receiving antenna for the frequency bands and disposed at a predetermined distance from each of the transmission-receiving antennas, thereby constituting a diversity antenna adaptive to the frequency bands.

7. The electronic device according to claim 6, wherein

the receiving antenna is provided between the two transmission-receiving antennas.

8. The electronic device according to claim 6, wherein

the antenna unit is provided at a portion of the display unit on a side opposite to the display panel;

the transmission-receiving antennas include a first transmission-receiving antenna adapted to a first frequency band on a wavelength λa and a second transmission-receiving antenna adapted to a second frequency band on a wavelength λb; and

the receive-dedicated antenna is

disposed at a distance of "(2n + 1) *λa/4 (however, n = 1, 2, 3, ...) from the first transmission-receiving antenna, and

disposed at a distance of "(2n + 1) *λb/4 (however, n = 1, 2, 3, ...) from the second transmission-receiving antenna.

9. The electronic device according to claim 6, wherein

the transmission-receiving antennas include the first transmission-receiving antenna adapted to the first frequency band on the wavelength λa and the second transmission-receiving antenna adapted to the second frequency band on the wavelength λb;

the receive-dedicated antenna is

configured to be disposed at a distance of "(2n + 1) *λa/4 (however, n = 1, 2, 3, ...) from the first transmission-receiving antenna, and disposed at a distance of "(2n + 1) *λb/4 (however, n = 1, 2, 3, ...) from the second transmission-receiving antenna; and

the antenna unit is provided at a portion of the display unit to adapt to space diversity effects and polarization diversity effects.

10. The electronic device according to claim 6, wherein

the wireless communication unit includes a filter circuit for separating a radio frequency signal received by the receive-dedicated antenna into signals in the respective frequency bands.

11. An antenna unit for achieving a wireless communication function in different frequency bands are first and second frequency bands, the antenna unit comprising:

a first transmission-receiving antenna adapted to

the first frequency band;

a second transmission-receiving antenna adapted to the second frequency band;

a receiving antenna for the first and second frequency bands and disposed at a predetermined distance from each of the first and second transmission-receiving antennas, thereby constituting a diversity antenna adaptive to the frequency bands.

12. The electronic device according to claim 11, wherein

the receiving antenna is provided between the first and second transmission-receiving antennas.

13. The antenna unit according to claim 11, wherein

when a wavelength in the first frequency band is λa, and a wavelength in the second frequency band is λb,

the receive-dedicated antenna is

disposed at a distance of "(2n + 1) *λa/4 (however, n = 1, 2, 3, ...) from the first transmission-receiving antenna, and

disposed at a distance of "(2n + 1) *λb/4 (however, n = 1, 2, 3, ...) from the second transmission-receiving antenna.